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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/614,369	07/12/2000	David Mun-Hien Choy	AM9-99-0209	2248

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EXAMINER
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WOO, ISAAC M

ART UNIT	PAPER NUMBER
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2172

DATE MAILED: 05/03/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

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# Office Action Summary

Application No.

09/614,369

Applicant(s)

CHOY ET AL.

Examiner

Isaac M Woo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>15</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. This action is in response to Applicant's Amendments on December 29, 2003 have been considered but they are not persuasive. Pending claims are 1-14.

#### ***Response to Arguments***

2. In response to Applicant's remark filed on December 29, 2003, applicant argues that the combination of Carhart with Isip do not disclose or suggest, the referential integrity of "heterogenous link". However, Examiner does not agree. Isip discloses, the referential integrity (col. 7, lines 8-15, col. 9, lines 9-31, col. 7, lines 59-67 to col. 8, lines 1-6). And Carhart discloses the multi-database system that links together heterogeneous database, see (col. 1, lines 15-24, col. 3, lines 26-43), and multi-database system are distributed across a computer network, and the management of multi-database base system must link fields in multiple databases heterogeneous links for performing search operations over fields in multiple database table that are logically links together, see (col. 3, lines 3-22), which teaches that in multi-database management system, different database table must be linked together, which is "heterogeneous links". Thus, the combination of Carhart with Isip disclose or suggest, the referential integrity of heterogenous link. And all popular relational database management, design software tools (such as, Oracle, DB2, SQL, Sybase) provide the data referential integrity.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isip, Jr. (U.S. Patent No. 6,189,010) in view of Carhart et al (U.S. Patent No. 5,511,186, herein after, "Carhart").

With respect to claim 1, Isip discloses, the system for providing referential integrity (col. 7, lines 8-15, col. 9, lines 9-31, col. 7, lines 59-67 to col. 8, lines 1-6), RDBMS (col. 1, lines 10-25, col. 1, lines 60-67, DB2 is relational database management system from IBM) providing referential integrity (col. 7, lines 8-15, col. 9, lines 9-31, col. 7, lines 59-67 to col. 8, lines 1-6) for homogenous links (by foreign key, col. 2, lines 1-25, which teaches that foreign key that identifies another data table record); and the software layer on top of the RDBMS for causing the RDBMS to provide referential integrity, see (col. 7, lines 8-15, col. 9, lines 9-31, col. 7, lines 59-67 to col. 8, lines 1-6), the software layer maintaining at least one data structure useful in ensuring referential integrity, see (460, perform RI constraint checking, FIG. 4, 550, FIG. 5, col. 7, lines 8-67). Isip discloses the referential integrity (col. 7, lines col. 9, lines 9-31, col. 7, lines 59-

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67 to col. 8, lines 1-6) for homogenous links, see (by foreign key, col. 2, lines 1-25). Isip does not explicitly disclose the referential integrity "for heterogeneous links". However, Carhart discloses the multi-database system that links together heterogeneous database, see (col. 1, lines 15-24, col. 3, lines 26-43), and multi-database system are distributed across a computer network, and the management of multi-database base system must link fields in multiple databases heterogeneous links for performing search operations over fields in multiple database table that are logically links together, see (col. 3, lines 3-22), which teaches that in multi-database management system, different database table must be linked together, which is "heterogeneous links". The system of Isip provides referential integrity with checking (by CHECK utility, col. 7, lines 32-44) the index between parent table and child table (for example, between Order\_Entry table (110, fig.1) and Index table (130, fig.1), col. 6, lines 11-50). The system of Isip can be only applied on homogeneous database management system, e.g., only for DB2. However, the system of Carhart is a relational heterogeneous database management system that comprises a relational database table that is used for designing relational database model with linking heterogeneous and disparate database (multi-vendor, col. 3, lines 25-32, col. 2, lines 54-67). Carhart provides a method for integrating different databases with joining relational database table by linking fields. Thus, Order\_Entry table and Index table of the database in Isip can be modified to include a multi-database as taught in Carhart to provide referential integrity among heterogeneous database. Therefore, it would have been obvious a person having ordinary skill in the art the time invention was made to include a plurality of databases taught in Carhart to the database

in Isip to provide referential integrity for heterogeneous link. In order to manage multi-database (heterogeneous database), database tables should be linked together to provide effective multiple database management as if data came from a homogeneous database.

With respect to claim 2, Isip discloses that the software layer maintains at least one table, see (col. 6, lines 28-45).

With respect to claim 3, Isip discloses that the table is accessed upon an attempted deletion or updating of a tuple references by a link, and the attempted deletion or updating is selectively disallowed base on the table, see (col. 11, lines 55-67 to col.12, lines. This teaches in DB2's written command, when constraint occurs for command DELETE, the DB2 system selectively disallows DELETE command for the database rows that violate link integrity, in stead, using UPDATE command).

With respect to claim 4, Isip discloses that the software layer includes at least one stored procedure accessible by an application to insert, update, or delete a tuple while ensuring referential integrity in heterogeneous links associated with the tuple, see (col. 7, lines 9-58).

With respect to claim 5, Isip discloses the providing at least one link table in a non-RDBMS element communicating with at least one RDBMS, see (col. 7, lines col. 9,

lines 9-31, col. 7, lines 59-67 to col. 8, lines 1-6) at least one table having a link column, the table being associated with the scoped column; and accessing the table to ensure referential integrity in an DBMD, see (col. 7, lines 8-15, col. 9, lines 9-31, col. 7, lines 59-67 to col. 8, lines 1-6). Isip discloses the link table provides referential integrity, see (col. 58-67 to col. 8, lines 1-50). Isip does not explicitly disclose the heterogeneously scoped link table. However, Carhart discloses the links together heterogeneous database, see (col. 1, lines 15-24, col. 3, lines 26-43), and the relational theta-join operator, which takes as its operands two or more relational tables and yields what is logically a new table, which is a join of the operand tables, theta-join operation on a number of databases linked to each other and retrieving a selected set of fields for joined records for relations in two relational databases used even with different database management systems, see (col. 11, lines 20-34). This teaches the joining of a plurality of different databases linked (heterogeneous databases) creates the logical new database table that is the heterogeneously scoped link table. Thus, the Order\_Entry table and Index table of the database in Isip can be modified to include the logical new table (the heterogeneously scoped link table) as taught in Carhart to provide referential integrity among heterogeneous database. Therefore, it would have been obvious a person having ordinary skill in the art the time invention was made to include the heterogeneously scoped link table taught in Carhart to the database in Isip to provide referential integrity for heterogeneous scoped link in relational database management system. Because referential integrity in multiple (heterogeneous)

database link table provides no dangling point, which makes the relational database's integrity.

With respect to claim 6, Isip discloses that the HSL table is accessed when a link attribute is sought to be changed, see (updated, col. 5, lines 41-53).

With respect to claim 7, Isip discloses that the HSL table is accessed when a tuple is sought to be changed or deleted, see (col. 7, lines 8-58).

With respect to claim 8, Isip discloses that that the HSL table is established by an RI table, see (col. 7, lines 8-58).

With respect to claim 9, Isip discloses that at least one trigger useful in selectively disallowing operations, see (col. 11, lines 55-67 to col.12, lines. This teaches in DB2's written command, when constraint occurs for command DELETE, the DB2 system selectively disallows DELETE command for the database rows that violate link integrity, in stead, using UPDATE command).

With respect to claim 10, Isip discloses that at least one procedure accessible by an application to insert, update, or delete a tuple while ensuring referential integrity in heterogeneous links associated with the tuple, see (col. 7, lines 8-58, col. 8, lines 30-67).



5. Claims 11 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carhart et al (U.S. Patent No. 5,511,186, herein after, "Carhart").

With respect to claim 11, Carhart discloses, the computer program products including usable code means programmed with logic for ensuring referential integrity in an RDBMS having at least one table, see (col. 3, lines 26-55), the computer readable code means for maintaining a table in a software layer not part of the RDBMS (col. 2, lines 43-53), computer readable code means for using the table to ensure that operations on tuples in the RDBMS (col. 6, lines 27-61, searching operations on tuples) in a heterogeneously scoped link, see (col. 1, lines 15-24, col. 3, lines 26-43, disclosed invention of Carhart is a relational heterogeneous database management system that comprises a relational database table that is used for design relational database model with linking heterogeneous database together to express interrelationships among sets of databases that include hierarchical, relational and other kinds of databases. Carhart provides a method for integrating different databases with joining relational database table by linking tuples, see (col. 3, lines 25-67 to col. 4, lines 1-64)). Carhart discloses the heterogeneously scoped link, see (col. 1, lines 15-24, col. 3, lines 26-43). Carhart does not explicitly disclose the heterogeneously scoped link, "do not result in pointing to no tuple". However, Carhart discloses, query of the first table is made to retrieve incrementally the records (rows) that satisfy the first table factors and that have no

NULL linking fields, see (col. 4, lines 50-63). This teaches in order to join heterogeneous database, the steps of creating linking fields is making sure if there is no NULL linking tuple. Therefore, it would have been obvious a person having ordinary skill in the art the time invention was made to include "do not result in pointing to no tuple" in the system of Carhart to provide no NULL tuple for heterogeneous link in relational database management system. Because making sure for "no null tuple" provides no dangling point that violates referential integrity in relational database. Thus, no null tuple keeps the database links together logically.

With respect to claims 13-14, Carhart discloses, computer readable code means for inserting, delete trigger, and an update trigger for tuple, see (col. 26-38, col. 8, lines 27-34) and ensuring referential integrity in heterogeneous links associated with the tuple, see (col. 1, lines 15-24, col. 3, lines 26-43).

6. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Carhart et al (U.S. Patent No. 5,511,186, herein after, "Carhart") in view of Hoover et al (U.S. Patent No. 5,560,005, herein after, "Hoover").

With respect to claim 12, Carhart discloses, computer readable code means for establishing at least one trigger useful in cooperation with the table for selectively disallowing operation, see (col. 2, lines 1-31, relational database management application provides (for instance, DB2), the operation commands DELTE, UPDATE,

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etc. Carhart does not explicitly disclose selectively disallowing operation. However, Hoover discloses, "only certain selected fields require updating. It is contemplated that the UPDATE operation may be permitted only on certain fields and disallowed on other fields containing particularly critical information. For example, an update operation would not be allowed to change an object identifier, and additional safeguards are required for changing primary key fields", see (col. 34, lines 66-67 to col. 35, lines 1-18). This teaches that selectively disallowing operations on relation database management system. Therefore, it would have been obvious a person having ordinary skill in the art the time invention was made to include selectively disallowing operation taught in Hoover to the relational database management system in Carhart to provide the database management system's selective operations. Because in order to update specific fields of database table, only given fields of database table are updated. Thus, selectively updating operation (selectively disallowing the other fields) provides efficient database management operation commands.


**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Isaac M Woo whose telephone number is (703) 305-0081. The examiner can normally be reached on 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E Breene can be reached on (703) 305-9790. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

IMW  
April 29, 2004

  
SHAHID ALAM  
PRIMARY EXAMINER